2001 National Workshop on State Building Energy Codes – July 18, 2001

Session 2B -Voluntary Beyond Codes Efforts

The U.S. Green Building Council's Leadership in Energy & Environmental Design (LEED) Green Building Rating System Overview

Loren A. Doe – Burlington Electric Department

BURLINGTON Electric DEPARTMENT

LEED Green Building Rating System™

- Initiated and operated by the US Green Building Council, a membership organization
- A standard for what constitutes a "green building"
- Voluntary / consensus-based / market-driven
- Self-assessing system designed for rating new and existing commercial, institutional, and high-rise residential buildings
- A balance between known effective practices and emerging concepts

LEED Criteria Categories

- Sustainable Sites
- Water Efficiency
- Energy and Atmosphere
- Materials and Resources
- Indoor Environmental Quality
- Innovation credits and design/build process

Sustainable Sites

- P Erosion and sediment control
- 1 Site selection (wetlands, ag land, habitat)
- 2 Urban redevelopment
- 3 Brownfield redevelopment
- 4 Alternative transportation
- 5 Reduced site disturbance
- 6 Storm water management
- 7 Reduce heat islands
- 8 Light pollution reduction

Water Efficiency

- 1 Water efficient landscaping
- 2 Innovative waste water treatment
- 3 Water use reduction

Energy and Atmosphere

- P1 Building commissioning
- P2 Minimum Energy Performance (ASHRAE 90.1-99)
- P3 Zero CFC's
- 1 Optimize energy performance
- 2 Renewable energy
- 3 Additional commissioning
- 4 Eliminate HCFC's
- 5 Performance measurement &verification
- 6 Green Power - meets Green-E standard

Materials and Resources

- P Storage and collection of recyclables
- 1 Building Re-use - up to 3 pts
- 2 Construction waste management
- 3 Resource re-use
- 4 Recycled content
- 5 Local/regional materials
- 6 Rapidly renewable material
- 7 Certified wood

Indoor Environmental Quality

- P1 Meet 62-99, ASHRAE Ventilation code
- P2 Environmental smoke control
- 1 CO2 monitoring, control
- 2 Increase ventilation effectiveness
- 3 Construction IAQ management plan
- 4 Low-emitting materials
- 5 Indoor chemical and pollutant source control
- 6 Controllability of systems
- 7 Thermal comfort
- 8 Daylight and views

Innovation Credits and Design/build Process

- 1 Innovation
- 2 Accredited designer
  - Recognition as LEED™ Accredited Professionals on the USGBC web site, and
  - One point toward LEED™ Certification of their green building projects.

LEED Green Building Certification Levels

- 26 – 32 Certified
- 33 – 38 Silver Rating
- 39 – 51 Gold Rating
- 52 + Platinum Rating

LEED Platinum Rating
Phillip Merrill Environmental Center,
Chesapeake Bay Foundation
Annapolis, MD

Standards or Regulations Referenced in LEED™

Asbestos
Occupational Safety and Health Administration Asbestos Regulations in 29 CFR Part 1926 Safety and Health Regulations for Construction

Building Commissioning
U. S. General Services Administration 'Model Commissioning Plan and Guide Specification'
Bonneville Power Administration Building Commissioning Guidelines - 2nd Edition BPA Publication Office: 503-230-7334

Building Materials
South Coast Rule #1168 - South Coast Air Quality Management District
Regulation 8, Rule 51 - Bay Area Air Quality Management District BAAQMD: 415-771-6000
Title 7, Chapter 27, Subchapter 23 - New Jersey State Department of Environmental Protection

Brownfield Development
U.S. Environmental Protection Agency OSWER Dir. 9610.17
ASTM Standard Practice E1739: Site Remediation

Energy Efficiency
ASHRAE/IES 90.1-1989 'Energy Efficient Design of New Buildings Except New Low-Rise Residential Buildings' U.S. Department of Energy International Performance Measurement and Verification Protocol (IPMVP)
California Title 24 Lighting
U.S. Environmental Protection Agency Energy Star Buildings Requirements 800-STAR-YES (782-7937)

Erosion Control

Maryland Department of the Environment Maryland Model Erosion and Sediment Control Ordinance - Sections 4.2 e & f

Maryland Department of the Environment Maryland Model Stormwater Management Ordinance - Section 6 (Group 2)

Indoor Air Quality

ASHRAE 62-1989 'Ventilation for Acceptable Indoor Air Quality' (ANSI approved)

Sheet Metal and Air Conditioning Contractors National Association (SMACNA) 'IAQ Guidelines for Occupied Buildings Under Construction.' (Alphabetical listing only)
SMACNA technical publications: 703-803-2980.

Filters providing 85% filtration as tested according to ASHRAE Standard 52.1-1992: 'Gravimetric and Dust-Spot Procedures for Testing Air-Cleaning Devices Used in General Ventilation for Removing Particulate Matter' (ANSI approved)

Thermal Comfort
ASHRAE 55-1992 'Thermal Environmental Conditions for Human Occupancy' (ANSI approved)

Water Conservation
Energy Policy Act of 1992 - Plumbing Fixture requirements (42 USC Section 6295 (j))

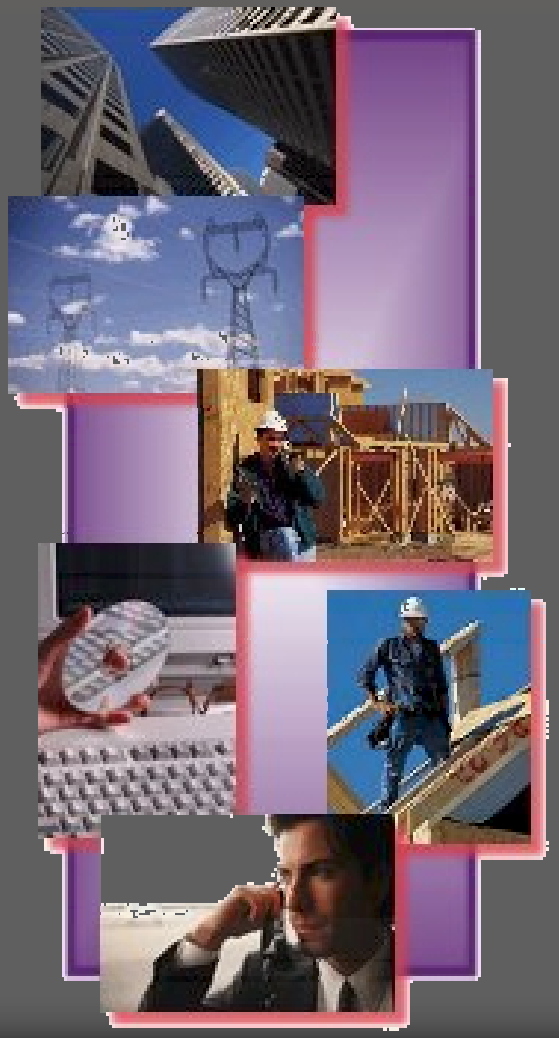
Water Quality

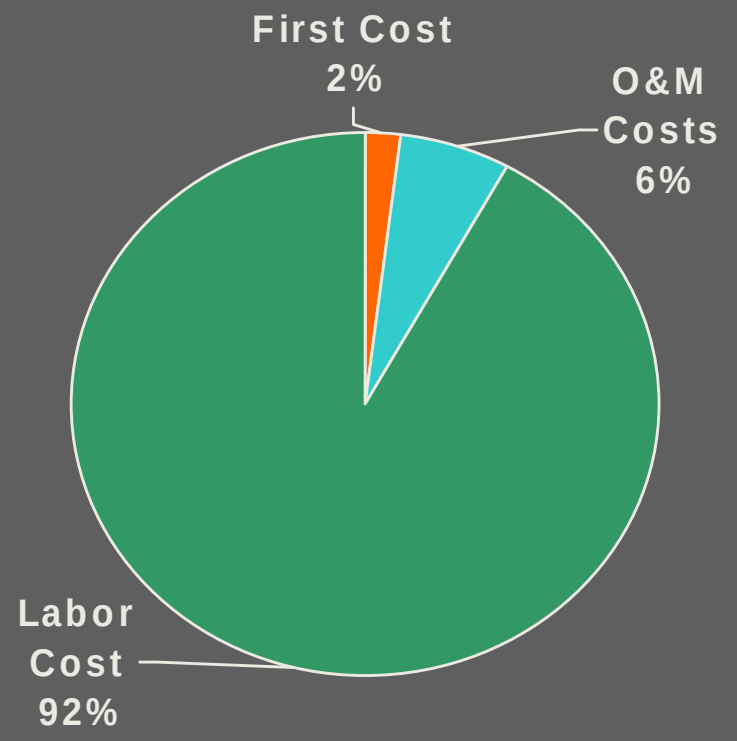
U.S. Environmental Protection Agency Publication # 812-B-94-002: "Lead in Drinking Water in Schools and Non-Residential Buildings," April 1994
Contact EPA: 800-276-0462, request publication #G158

Why Consider a "Green" Building and LEED?

- Can achieve lower first cost.
  - Advanced thermal envelope can significantly reduce heating and cooling equipment sizes.
- Lower long term operating and maintenance costs.
- Longer life of the building and finishes.
- Improved worker comfort and productivity.
- Significant image and good will benefits for the entity.
- Lowered impact on the environment.
- LEED is the only nationally recognized objective standard to rate Green building designs.

Long Term Benefits





Benefits of Green Building Design

- Durability – making the buildings last
  - Moisture control.
  - Durable materials & design.
- Energy Efficiency
  - Minimize heating and cooling loads.
  - Advanced insulation system.
  - Can achieve half the AC size of typical building.
  - Windows w/ twice the insulating performance.
  - Advanced lighting – day lighting.

Benefits of Green Building Design – cont.

- Water Efficiency
  - Water eff. Landscaping
  - Rain water recovery
  - Water use reduction
- Resource Efficiency
  - Construction waste management
  - Materials with recycled content
  - Local or regional materials
  - Certified lumber

Benefits of Green Building Design – cont.

- Health & Environment
  - Advanced ventilation systems – CO2 monitoring
  - Moisture control
  - Clean-able surfaces
  - Low- emitting materials
  - Reduced site disturbance
  - Linkage to alternative transportation

Sustainable Energy Supply

- Renewable Energy
  - Green Energy
  - Solar hot water
  - PV panels
  - Wind turbines
  - Biomass fuel

Burlington Electric Department Green Building Program

- Logical extension of BED's energy efficiency programs.
- Funded "Green" Building Consultants for two demonstration projects.
  - Brought designers together as a team to complete a holistic design.
  - By quantifying costs and benefits owners make better decisions.
  - Design incentives ➔ better owner decisions ➔ reduced capital cost incentives.

Burlington Electric Department Green Building Program

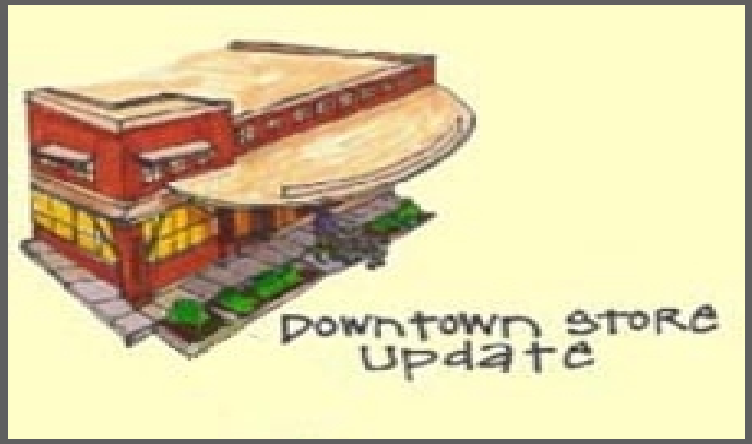
- Sells the benefits of sustainable building design.
- The program is now focusing on providing resources and information.
- Provides incentives for Commissioning and LEED Application process.
- Assist with recognition efforts – greatly appreciated.

Burlington Electric Department Green Building Program

- Currently have 4 projects that are under design and/or construction seeking LEED Certification.

Fletcher Allen Health Care, Renaissance Project

Burlington Electric Department Green Building Program



Onion River Coop, Downtown Store

Burlington Electric Department Green Building Program

College & Lake Project

Main Street Landing Co.

LEED Overview Conclusion

- Understand and sell the benefits of sustainable building design.
  - Provides impressive financial returns in energy, water and other O&M.
  - Delivers productivity improvements and more durable buildings.
  - All with a much lower long term impact on the environment.

LEED Overview Conclusion

- Focus on facilitating and providing resources and information.
- Help locate possible funding sources.
- Encourage Commissioning.
- Provide recognition.

Thank You

BURLINGTON Electric DEPARTMENT